

WHAT IS CLAIMED IS:

1 ~~55~~ 1. A computer program product for populating a database with  
 2 manipulated biological information, said computer program product comprising:  
 3 code for providing a plurality of cells in various stages of the cell cycle,  
 4 said stages of the cell cycle including at least one selected from interphase, G0 phase, G1  
 5 phase, S phase, G2 phase, M phase, prophase, prometaphase, metaphase, anaphase, and  
 6 telophase;  
 7 code for manipulating said cells in said various stages of cell cycle  
 8 development to form a plurality of manipulated cells;  
 9 code for capturing an image of said plurality of manipulated cells;  
 10 code for determining a descriptor from said image for said manipulated  
 11 cells;  
 12 code for populating a database with said descriptor;  
 13 wherein said image includes a first component of a cell and a second  
 14 component of said cell; and  
 15 a computer readable storage medium for holding the codes.

1 2. The computer program product of claim 1 wherein said first  
 2 component and said second component are selected from a protein, a protein  
 3 modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure and an  
 4 organelle.

1 3. The computer program product of claim 1 wherein said image is a  
 2 digitized representation of said plurality of manipulated cells.

1 4. The computer program product of claim 3 wherein said digitized  
 2 representation provides a density value of said plurality of manipulated cells.

1 ~~55~~ 5. The computer program product of claim 1 wherein said descriptors  
 2 comprise numeric or logical values.

1 6. The computer program product of claim 5 wherein said values  
 2 further comprises a nucleotide.

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1 The computer program product of claim 5 wherein said values  
2 further comprises an amino acid letter.

1 8. A computer program product for determining a property of a  
2 manipulation based upon effects of said manipulation on at least two of a plurality of  
3 components of at least one of a plurality of cells, said computer program product  
4 comprising:

5 code for providing at least one of a plurality of samples of said  
6 manipulation to said at least one of a plurality of cells;

7 code for determining at least one of a plurality of features of said at least  
8 two of a plurality of components of at least one of a plurality of cells in the presence of  
9 said manipulation;

10 code for determining at least one of a plurality of descriptors, said  
11 descriptors comprising at least one of said plurality of features;

12 code for searching a plurality of descriptors obtained from a database to  
13 locate descriptors based upon one of said descriptors of said manipulation, said searching  
14 forming a plurality of located descriptors;

15 code for determining, based upon said located descriptors, properties of  
16 said manipulation based upon said located descriptors;

17 wherein said two of a plurality of components includes a first component  
18 and a second component of a cell, said code for determining at least one of a plurality of  
19 descriptors of a state comprises code for combining information about said first  
20 component and said second component; and

21 a computer readable storage medium for holding the codes.

1 9. The computer program product of claim 8 wherein said plurality of  
2 components are selected from a protein, a protein modification, a nucleic acid, a lipid, a  
3 carbohydrate, a sub-cellular structure and an organelle.

1 10. The computer program product of claim 8 wherein said code for  
2 determining said plurality of located descriptors further comprises code for determining a  
3 plurality of matching descriptors, said matching descriptors corresponding to a prior  
4 administration of said manipulation, said prior administration of said manipulation having  
5 at least one of a plurality of properties.

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11. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a chemical factor.
12. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a biological factor.
13. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying an electromagnetic factor.
14. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a gravitational factor.
15. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a mechanical factor.
16. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a thermal factor.
17. The computer program product of claim 8 wherein said manipulation comprises a temporal factor.
18. The computer program product of claim 8 wherein said code for providing a manipulation comprises code for applying a nuclear factor.
19. The computer program product of claim 8 wherein said properties comprises toxicity.
20. The computer program product of claim 8 wherein said properties comprises specificity against a subset of tumors.
21. The computer program product of claim 8 wherein said properties comprises a mechanism of chemical activity.
22. The computer program product of claim 8 wherein said properties comprises a mechanism of biological activity.
23. The computer program product of claim 8 wherein said properties comprises a target protein.

1                   24.    The computer program product of claim 8 wherein said properties  
2 comprises a mechanism of action.

1                   25.    The computer program product of claim 8 wherein said properties  
2 comprises a structure.

1                   26.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of adverse biological effects.

1                   27.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of biological pathways.

1                   28.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of adverse clinical effects.

1                   29.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of cellular availability.

1                   30.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of pharmacological properties.

1                   31.    The computer program product of claim 8 wherein said properties  
2 comprises a gene expression profile.

1                   32.    The computer program product of claim 30 wherein said  
2 pharmacological properties comprises absorption.

1                   33.    The computer program product of claim 30 wherein said  
2 pharmacological properties comprises excretion.

1                   34.    The computer program product of claim 30 wherein said  
2 pharmacological properties comprises distribution.

1                   35.    The computer program product of claim 30 wherein said  
2 pharmacological properties comprises metabolism.

1                   36.    The computer program product of claim 8 wherein said properties  
2 comprises pharmacodynamic properties.

1 ~~Sub 24~~ 37. The computer program product of claim 8 wherein said properties  
2 can be selected from clinical uses and indications, human and veterinary diagnostic uses  
3 and tests, or human and veterinary prognostic uses and tests..

1 38. The computer program product of claim 8 wherein said descriptor  
2 comprises a scalar.

1 39. The computer program product of claim 8 wherein said descriptor  
2 comprises a vector.


1 ~~Sub 25~~ 40. A computer program product of mapping a manipulation of cells  
2 based upon a morphological value, said computer program product comprising:  
3 code for capturing a morphological value from said plurality of cells said  
4 cells being manipulated;  
5 code for assigning a degree of presence of said morphological value; and  
6 code for storing said morphological value and said degree of presence;  
7 wherein said morphological value is derived from a first component of a  
8 cell and a second component of said cell, said code for capturing said morphometric value  
9 from said plurality of cells comprises code for determining a relationship between said  
10 first component and said second component; and  
11 a computer readable storage medium for holding the codes.

1 41. The computer program product of claim 40 wherein said first  
2 component and said second component are selected from a protein, a protein  
3 modification, a nucleic acid, a lipid, a carbohydrate, a subcellular structure and an  
4 organelle.

1 42. The computer program product of claim 40 wherein said  
2 manipulation occurs in a manner selected from a electrical source, a chemical source, a  
3 thermal source, a gravitational source, a nuclear source, a temporal source, and a  
4 biological source.

1 43. The computer program product of claim 42 wherein said chemical  
2 source is selected from a pharmacological candidate and a drug screening library.

1 44. The computer program product of claim 40 wherein said  
2 morphological value is selected from a count, an area, a perimeter, a length, a breadth, a  
3 fiber length, a fiber breadth, a shape factor, a elliptical form factor, an inner radius, an  
4 outer radius, a mean radius, an equivalent radius, an equivalent sphere volume, an  
5 equivalent prolate volume, an equivalent oblate volume, an equivalent sphere surface  
6 area, an average gray value, a total gray value, and an optical density.

1  45. The computer program product of claim 40 wherein said degree of  
2 presence is multiple of a quantized value.

1 46. A computer program product of predicting properties of an  
2 unknown compound based upon information about effects of at least one of a plurality of  
3 known compounds on a first cell population, said computer program product comprising:  
4 code for populating a database with descriptors for known compounds,  
5 wherein said descriptors are determined from imaging said first cell population;  
6 code for determining descriptors for cells subjected to the unknown  
7 compound, wherein said descriptors are determined from imaging a second cell  
8 population;  
9 code for determining a relationship between said descriptors of said  
10 unknown compound with said descriptors of said known compounds;  
11 code for making an inference about said unknown compound based upon  
12 said descriptors of said known compounds; and  
13 a computer readable storage medium for holding the codes.

1 47. The computer program product of claim 46 wherein said code for  
2 determining descriptors comprises code for determining a relationship between said first  
3 component and said second component.

1 48. The computer program product of claim 47 w herein said first  
2 component and said second component are selected from a protein, a protein  
3 modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure and an  
4 organelle.

